OFFICE COPY

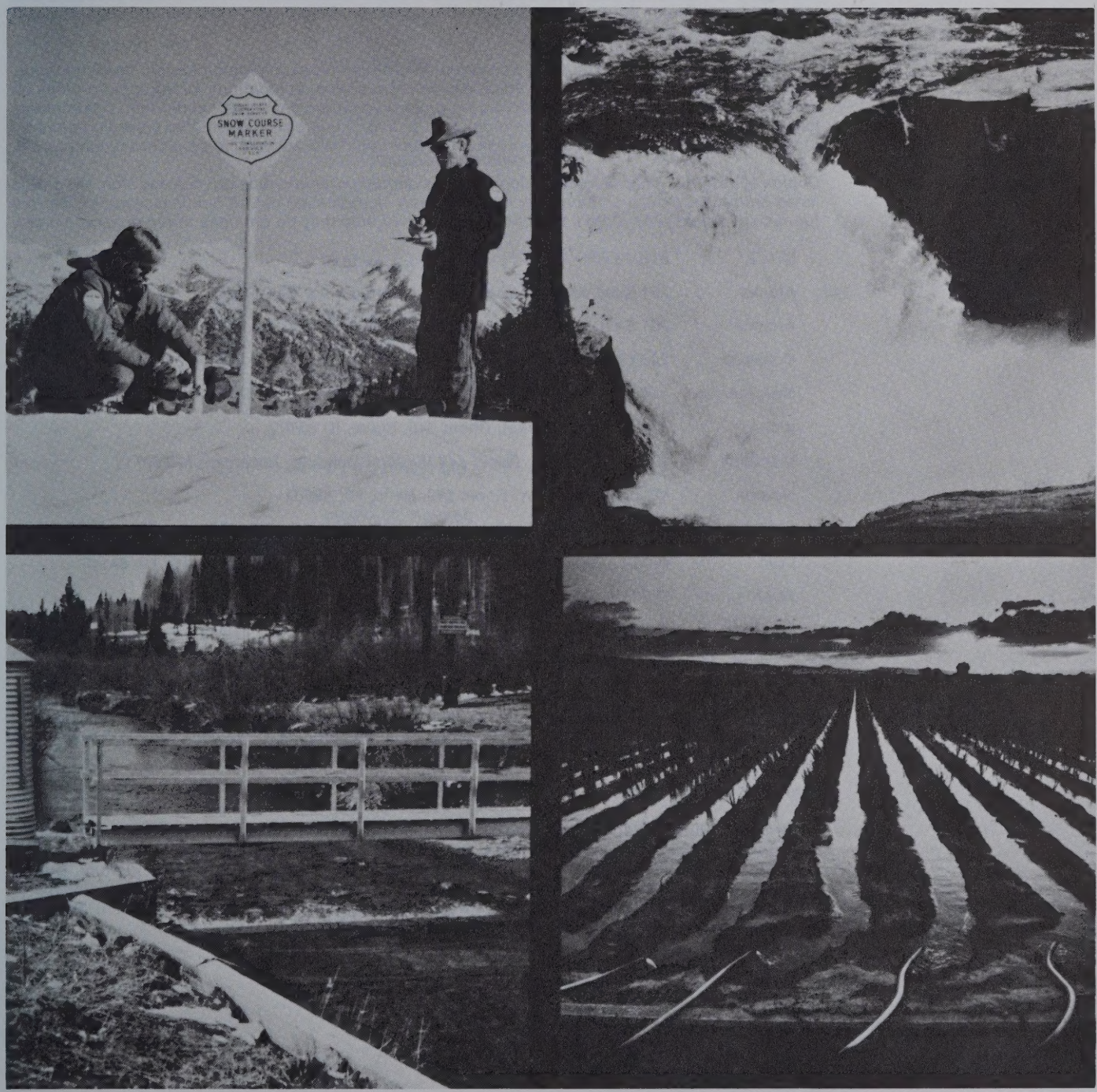
United States
Department of
Agriculture

**Soil
Conservation
Service**

**Bozeman,
Montana**

Montana
Water Supply Outlook

February 1, 1988



Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are terms reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado	2490 West 26th Ave., Denver, CO 80211
New Mexico	517 Gold Ave. S.W., Room 3301, Albuquerque, NM 87102-3157
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	1201 Terminal Way, Room 219, Reno, NV 89502
Oregon	1220 Southwest 3rd Ave., Room 1640, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201-1080
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82601

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 248, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resouces, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Environment Technical Services Division, 9820 106th St., Edmonton, Alberta T5K 2J6.

Montana
Water Supply Outlook

and

Federal – State – Private
Cooperative Snow Surveys

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

Released by

Glen H. Loomis
State Conservationist
Soil Conservation Service
Bozeman, Montana

Prepared by

Phillip E. Farnes
Snow Survey Supervisor
Soil Conservation Service
10 E. Babcock
Bozeman, Montana 59715

Programs and assistance of the United States Department of Agriculture are available without regard to race, creed, color, sex, age, or national origin.

Table of Contents

State Streamflow Map 3

State General Outlook 4

Basin Outlook and Conditions

- Kootenai Basin 6
- Flathead Basin 8
- Clark Fork Basin above Missoula 10
- Clark Fork Basin below Missoula 12
- Jefferson Basin 14
- Madison Basin 16
- Gallatin Basin 18
- Missouri Basin 20
- Sun, Teton and Marias Basins 22
- St. Mary and Milk Basins 24
- Yellowstone Basin 26

Snow Data Measurements 28

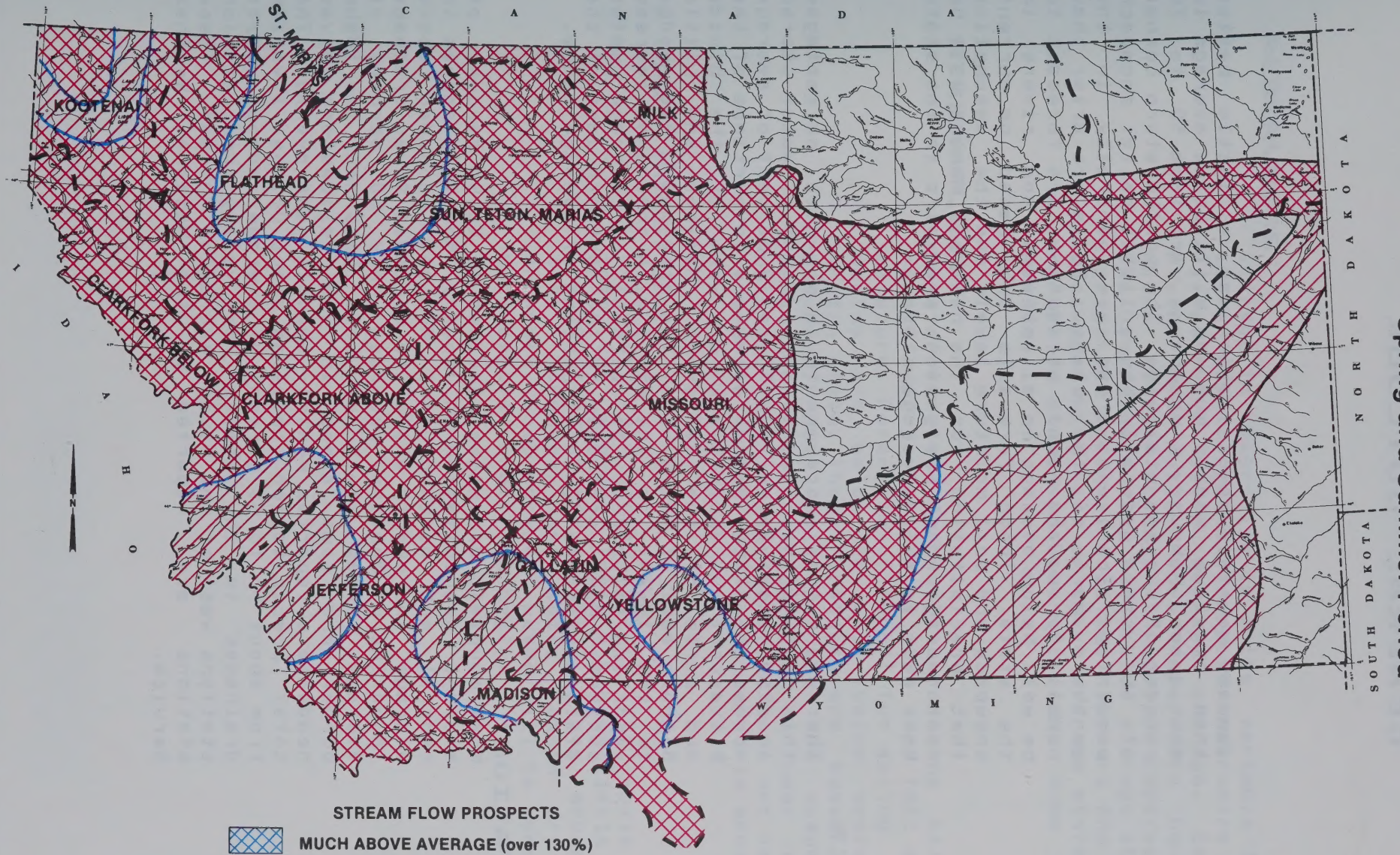
Additional Information 30

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

STREAMFLOW PROSPECTS FOR MONTANA

Spring and Summer Period



STREAM FLOW PROSPECTS

- MUCH ABOVE AVERAGE (over 130%)
- ABOVE AVERAGE (110-130%)
- NEAR AVERAGE (90-110%)
- BELOW AVERAGE (70-90%)
- MUCH BELOW AVERAGE (below 70%)
- NOT FORECAST

April-September Forecasts

February 1,1988

0 25 50 75 100 MI

0 50 100 150 KM

SOURCE: Information provided by SCS Snow Survey Personnel.

JUNE 1985 4-R-39296

USDA SCS-FORT WORTH, TEXAS 1985

GENERAL OUTLOOK

SUMMARY:

January mountain precipitation was a little better than previous months but was still below average in most areas. February 1 snowpacks vary from 50 to 70 percent of average statewide. The southwestern corner of the state generally has a little better snowpack percentage. The lowest areas are generally in the northern part of the state. Soils are drier than normal. Spring and summer streamflows are forecast to be well below average on all streams and rivers in the state. These forecasts are based on current snowpack and soil moisture levels and the assumption that precipitation for the next six months will be near average. Most irrigation reservoirs in the state have near to above average storage.

SNOWPACK:

There were some improvements in snowpack percentages this past month. Presently the amount of water stored in the snow varies from 50 to 70 percent of average across the state. Better areas are in portions of the Bitterroot and Upper Clark Fork west of the Divide and parts of the Jefferson, Madison and Little Bighorn east of the Divide. The area near Red Lodge is the lowest in the state with some snow courses reporting only 30 to 35 percent of average water content. Most drainages in the northern part of the state are in the 50 to 55 percent of average range.

PRECIPITATION:

Most mountain drainages received 80 to 90 percent of average precipitation in January. Mountain ranges in central and north-central Montana recorded above average increments while the Kootenai River drainage in northern Montana recorded only 60 percent of average. Areas south of Lolo Pass near the Idaho border and some areas in the Yellowstone River headwaters reported monthly amounts near average. The total precipitation received since October 1 varies from about 55 to 65 percent of average across major drainages in the state. Most valley precipitation stations west of the Divide are below normal. These stations are reported by the National Weather Service.

RESERVOIRS:

Storage in reservoirs is quite variable across the state. Most large multipurpose reservoirs west of the Divide have below average storage. East of the Divide, most multipurpose reservoirs have near or above average storage. Irrigation reservoirs west of the Divide generally have below average storage. Most irrigation reservoirs in the Missouri and Yellowstone drainages have near or above average storage with the exception of Lima Reservoir and some in central Montana.

STREAMFLOW:

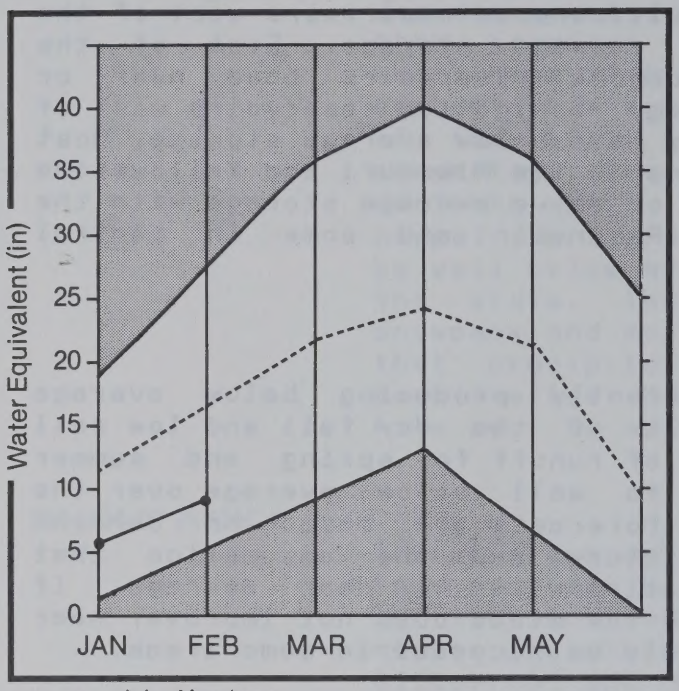
Most streams are currently producing below average runoff as a result of the dry fall and low soil moisture. Forecasts of runoff for spring and summer months are below to well below average over the entire state. These forecasts are based on current snowpack, soil moisture and the assumption that subsequent precipitation will be near average. If moisture flow across the state does not improve, near record low flows could be recorded in some areas.

SOIL MOISTURE:

Deficient fall precipitation left soils dry going into the winter. There has been little snowmelt in the mountains since snowfall began accumulating in late November and soils remain dry under the snowpack. Some snowmelt water will be absorbed by the soil before runoff can begin.

Kootenai Basin

Mountain snowpack* (inches)



*Kootenai in Montana

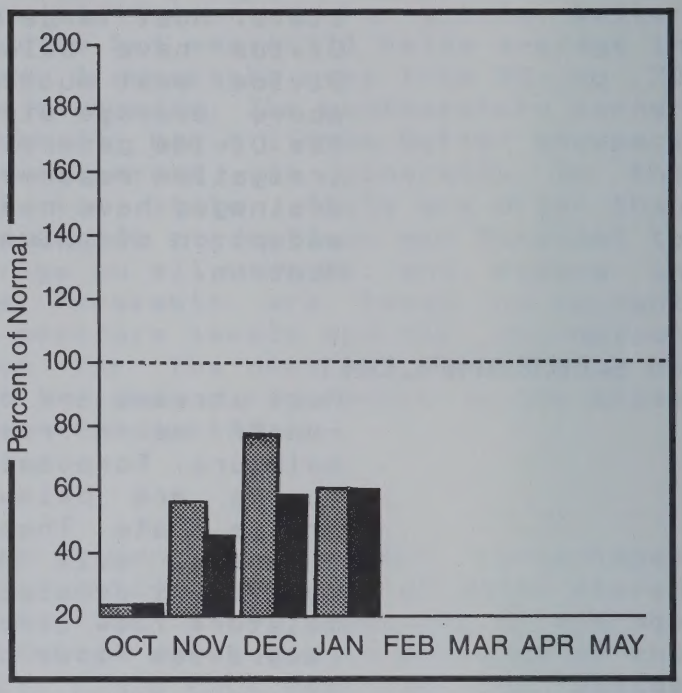
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Mountain precipitation in Montana drainages was below average again in January for the fifth consecutive month. The snowpack in both Montana and British Columbia watersheds is a little over one-half of average. Soils under the snowpack are drier than normal. Spring and summer runoff is forecast to be below average even if spring precipitation is near average.

For more information contact your local Soil Conservation Service office.

KOOTENAI RIVER BASIN in Montana

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
KOOTENAI RIVER blw Libby Dam 2	APR-JUL	5885.0	4180.0	71	5530.0	94	2830.0	48
	APR-SEP	6903.0	4900.0	71	6490.0	94	3310.0	48
FISHER RIVER near Libby	APR-JUL	240.0	158.0	66	225.0	94	91.0	38
	APR-SEP	256.0	169.0	66	240.0	94	97.0	38
YAAK RIVER near Troy	APR-JUL	494.0	295.0	60	430.0	87	155.0	31
	APR-SEP	517.0	325.0	63	470.0	91	180.0	35
KOOTENAI RIVER at Leonia 2	APR-JUL	7340.0	5250.0	72	6870.0	94	3640.0	50
	APR-SEP	8441.0	6040.0	72	7900.0	94	4180.0	50

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
LAKE KOOCANUSA	5748.0	2079.0	2544.0	2484.0

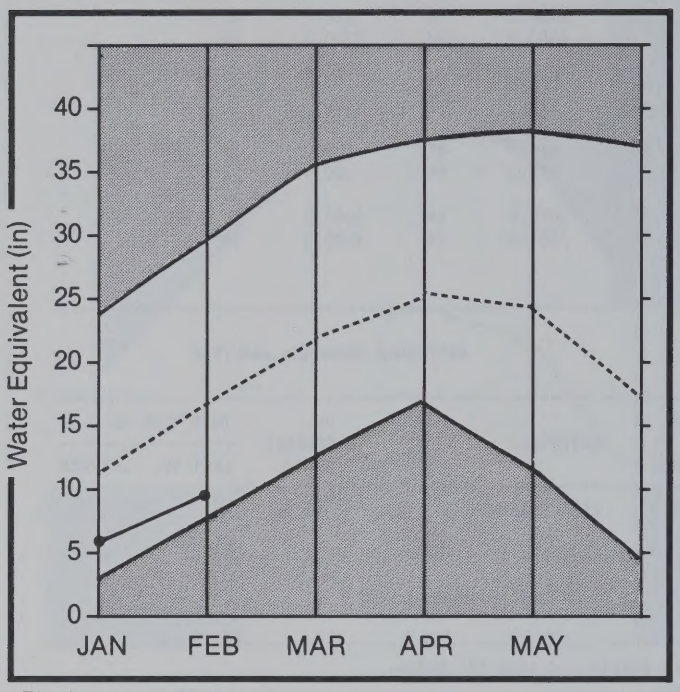
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
EAST KOOTENAI in B.C.	25	69	62
KOOTENAI in MONTANA	21	69	56
KOOTENAI ab BONNERS FERRY	45	69	59

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Flathead Basin

Mountain snowpack* (inches)



*Flathead

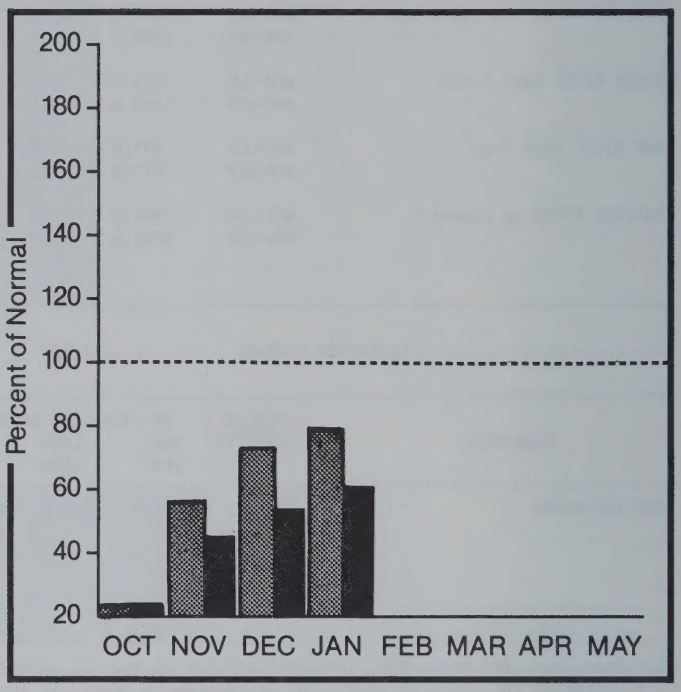
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Mountain precipitation in January was better than previous months but is still below average. Snowpacks vary from 50 to 65 percent of average across the various Flathead tributaries. Soils under the snow remain drier than usual. Forecasts of spring and summer runoff are for below average even if spring precipitation is near average. If weather patterns continue to bring below average moisture, runoff could be one of the lowest on record.

For more information contact your local Soil Conservation Service office.

FLATHEAD RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
NF FLATHEAD near Columbia Falls	APR-JUL	1701.0	1175.0	69	1480.0	87	870.0	51
	APR-SEP	1880.0	1300.0	69	1640.0	87	960.0	51
MF FLATHEAD near West Glacier	APR-JUL	1680.0	1195.0	71	1500.0	89	890.0	53
	APR-SEP	1836.0	1300.0	71	1630.0	89	970.0	53
SF FLATHEAD near Columbia Falls 1	APR-JUL	2110.0	1480.0	70	2030.0	96	930.0	44
	APR-SEP	2248.0	1580.0	70	2160.0	96	1000.0	44
FLATHEAD at Columbia Falls 1	ARP-JUL	5621.0	4200.0	75	5440.0	97	2950.0	52
	APR-SEP	6114.0	4280.0	70	5620.0	92	2940.0	48
SWAN RIVER near Big Fork	APR-JUL	597.0	405.0	68	510.0	85	300.0	50
	APR-SEP	683.0	460.0	67	580.0	85	340.0	50
FLATHEAD RIVER near Polson 2	APR-JUL	6586.0	4800.0	73	6000.0	91	3600.0	55
	APR-SEP	7150.0	4980.0	70	6250.0	87	3700.0	52

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
CAMAS (4)	45.2	14.9	22.2	20.1
MISSION VALLEY (8)	100.0	26.4	30.7	36.8
HUNGRY HORSE	3451.0	1887.0	2402.0	2406.0
FLATHEAD LAKE	1791.0	840.2	840.2	1133.0

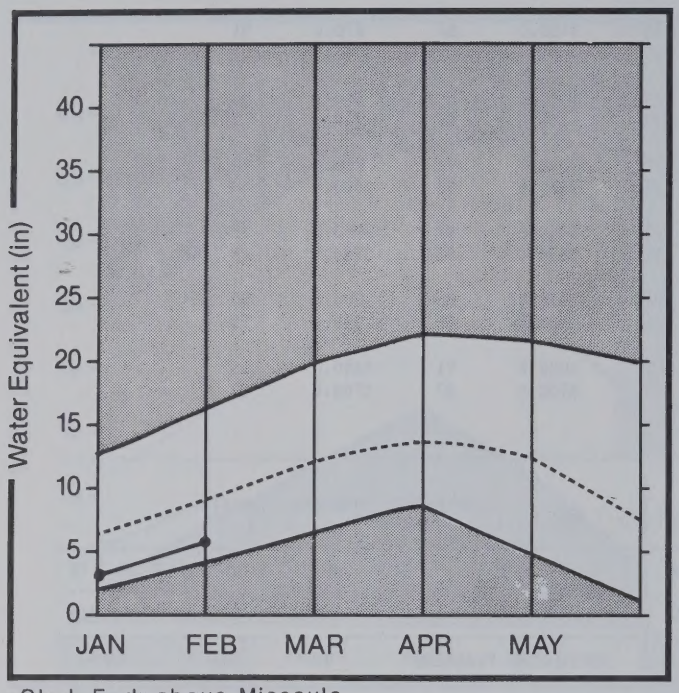
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
NORTH FORK FLATHEAD	14	66	58
MIDDLE FORK FLATHEAD	9	69	58
SOUTH FORK FLATHEAD	11	81	59
STILLWATER-WHITEFISH	8	77	54
SWAN	8	90	64
LITTLE BITTERROOT	6	83	50
FLATHEAD	39	74	59

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Clark Fork Basin above Missoula

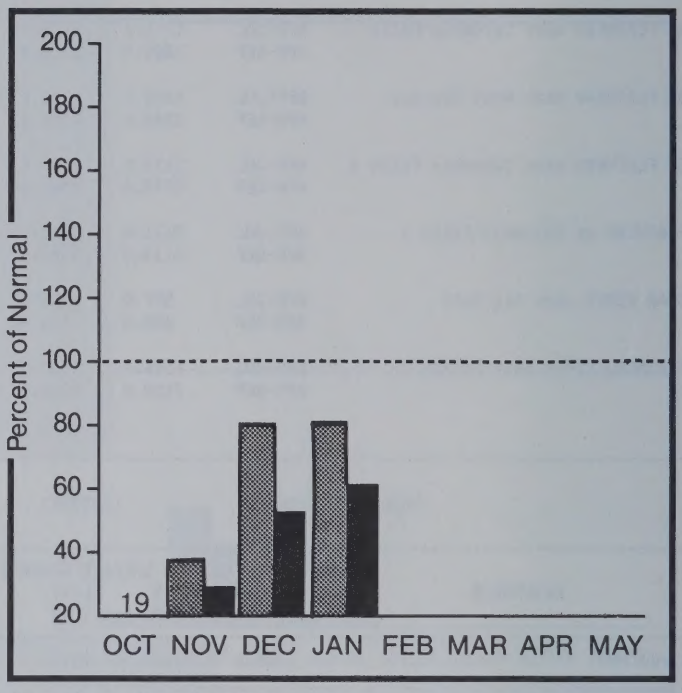
Mountain snowpack* (inches)



*Clark Fork above Missoula

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

During January, mountain precipitation was similar to December or about 80 percent of average. Snow surveys still continue to report snowpack water contents 60 to 65 percent of that expected by February 1. Soils under the snow remain drier than normal. Based on current snow and soil moisture conditions and assuming near average precipitation for the next six months, spring and summer streamflows are forecast to be well below average. If the moisture situation does not improve, runoff could be near minimum of record.

For more information contact your local Soil Conservation Service office.

CLARK FORK RIVER BASIN above Missoula

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
MOULTON RESERVOIR Inflow (MG)2	APR-JUN	237.0	154.0	65	220.0	93	88.0	37
	APR-JUL	263.0	170.0	65	244.0	93	96.0	37
WARM SPRINGS CR at Meyers Dam 2	APR-JUL	39.0	26.0	67	37.0	95	15.0	38
	APR-SEP	49.0	32.0	65	46.0	94	18.0	37
FLINT CREEK near Southern Cross 2	APR-JUL	14.8	10.6	72	16.0	108	5.0	34
	APR-SEP	17.8	13.1	74	20.0	112	6.0	34
FLINT CREEK below Boulder Creek 2	APR-JUL	61.0	43.0	70	66.0	108	20.0	33
	APR-SEP	78.0	55.0	71	85.0	109	25.0	32
LOWER WILLOW CR RES Inflow 2	APR-JUL	14.9	9.8	66	15.0	101	4.0	27
	APR-SEP	15.8	10.6	67	17.0	108	5.0	32
N. FK. ROCK CRK near Philipsburg	APR-JUL	69.0	48.0	70	67.0	97	29.0	42
	APR-SEP	77.0	54.0	70	76.0	99	32.0	42
NEVADA CREEK near Finn	APR-JUL	21.0	12.5	60	20.0	95	5.0	24
	APR-SEP	22.0	13.5	61	22.0	100	5.0	23
BLACKFOOT RIVER near Bonner	APR-JUL	874.0	595.0	68	750.0	86	440.0	50
	APR-SEP	969.0	650.0	67	825.0	85	475.0	49
CLARK FORK RIVER above Milltown 2	APR-JUL	703.0	480.0	68	720.0	102	240.0	34
	APR-SEP	812.0	550.0	68	820.0	101	275.0	34
CLARK FORK RIVER above Missoula	APR-JUL	1577.0	1070.0	68	1670.0	106	470.0	30
	APR-SEP	1781.0	1200.0	67	1880.0	106	520.0	29

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
GEORGETOWN LAKE	31.0	26.5	29.5	27.2
LOWER WILLOW CREEK	4.9	1.3	1.1	1.5
NEVADA CREEK	12.6	0.7	---	4.6

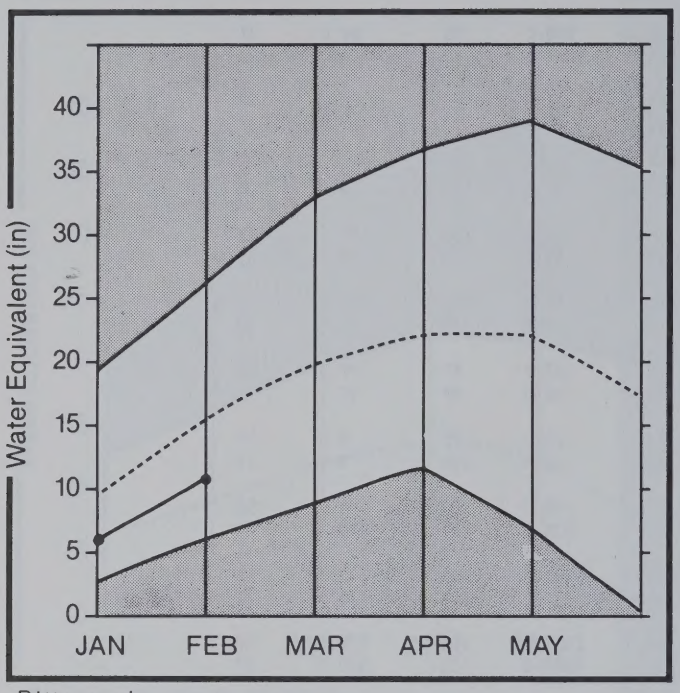
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
CLARK FORK ab BLACKFOOT	33	100	65
BLACKFOOT	17	95	62
CLARK FORK above MISSOULA	45	98	64

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Clark Fork Basin below Missoula

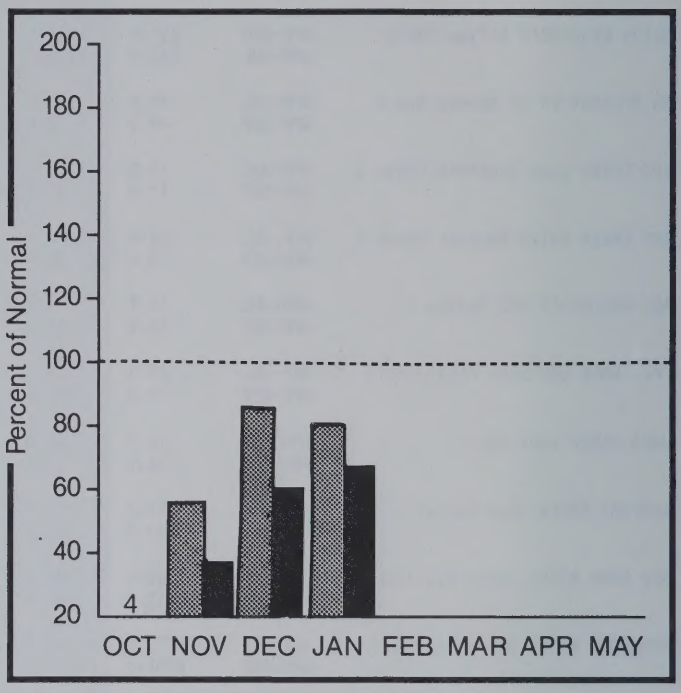
Mountain snowpack* (inches)



*Bitterroot

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

Mountain precipitation during January was similar to December and about 85 percent of average. Water stored in the snowpack is still 30 to 40 percent below average. In the Bitterroot drainage, snowpack is only a little better than last year at this time. Tributaries below Missoula have less snow than a year ago. Forecasts of spring and summer runoff are for well below average flows if precipitation is near average. If current weather patterns continue, streamflows could be lowest of record.

For more information contact your local Soil Conservation Service office.

CLARK FORK RIVER BASIN below Missoula

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
CLARK FORK RIVER above Missoula	APR-JUL	1577.0	1070.0	68	1670.0	106	470.0	30
	APR-SEP	1781.0	1200.0	67	1880.0	106	520.0	29
W.F. BITTERROOT RIVER nr Conner 2	APR-JUL	147.0	106.0	72	147.0	100	65.0	44
	APR-SEP	169.0	122.0	72	169.0	100	75.0	44
BITTERROOT RIVER near Darby	APR-JUL	524.0	367.0	70	515.0	98	220.0	42
	APR-SEP	573.0	400.0	70	560.0	98	240.0	42
SKALKAHO CREEK near Hamilton	APR-JUL	46.0	32.0	70	40.0	87	24.0	52
	APR-SEP	54.0	37.0	69	47.0	87	27.0	50
BURNT FORK CR nr Stevensville 2	APR-JUL	32.0	21.5	67	30.0	94	13.0	41
	APR-SEP	38.0	25.0	66	36.0	95	14.0	37
BITTERROOT RIVER at Missoula 2	APR-JUL	1371.0	950.0	69	1330.0	97	565.0	41
	APR-SEP	1497.0	1030.0	69	1450.0	97	610.0	41
CLARK FORK RIVER below Missoula	APR-JUL	2948.0	2020.0	69	2610.0	89	1430.0	49
	APR-SEP	3276.0	2230.0	68	2900.0	89	1600.0	49
CLARK FORK RIVER at St. Regis	APR-JUL	3894.0	2690.0	69	4170.0	107	1210.0	31
	APR-SEP	4325.0	2990.0	69	4630.0	107	1350.0	31
CLARK FORK RIVER near Plains 2	APR-JUL	10850.0	7400.0	68	10300.0	95	4470.0	41
	APR-SEP	11930.0	8140.0	68	11360.0	95	4900.0	41
THOMPSON RIVER near Thompson Falls	APR-JUL	222.0	116.0	52	174.0	78	58.0	26
	APR-SEP	250.0	140.0	56	205.0	82	75.0	30
PROSPECT CREEK at Thompson Falls	APR-JUL	128.0	84.0	66	120.0	94	48.0	38
	APR-SEP	137.0	92.0	67	130.0	95	54.0	39
CLARK FORK at Whitehorse Rapids 2	APR-JUL	12150.0	8180.0	67	11600.0	95	4800.0	40
	APR-SEP	13370.0	9010.0	67	12750.0	95	5270.0	39

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
PAINTED ROCKS LAKE		NO REPORT		
NOXON RAPIDS	335.0	324.7	295.8	314.2
COMO	34.9	5.0	7.8	11.4

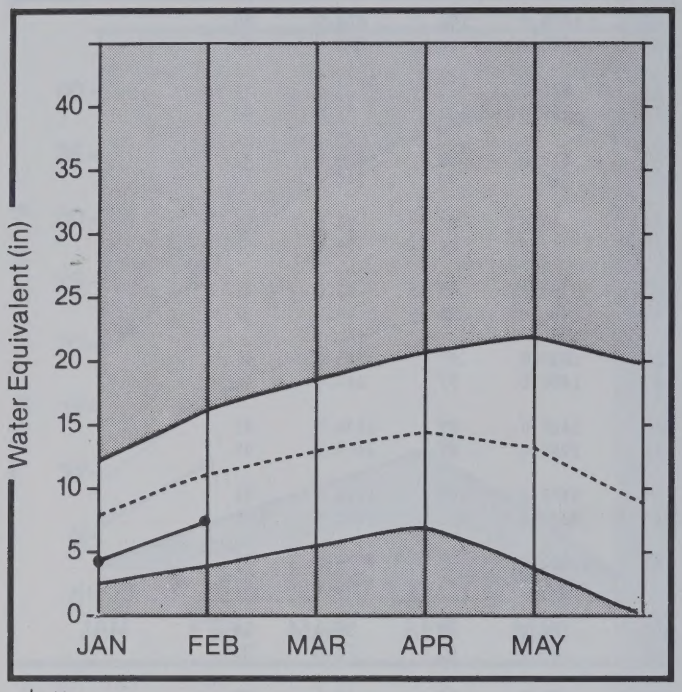
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
CLARK FORK above MISSOULA	45	98	64
BITTERROOT	14	107	71
LWR CLARK FK blw MISSOULA	18	79	58
BITTERROOT & LWR C.F.	30	89	63
CLARK FORK TOTAL	72	92	63
FLATHEAD	39	74	59
PEND O'REILLE	106	83	61

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Jefferson Basin

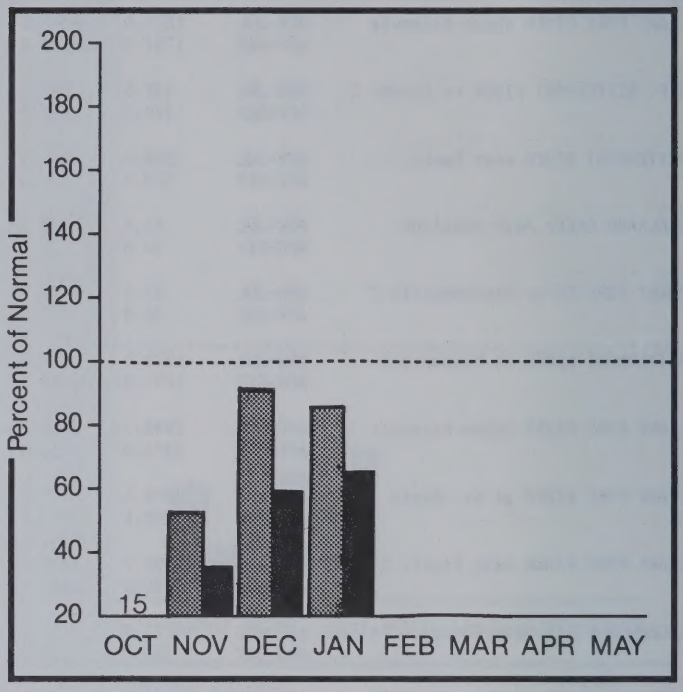
Mountain snowpack* (inches)



*Jefferson

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

Mountain precipitation during January was about 85 percent of average. Water stored in the snowpack varies from 60 to 70 percent of average across the various drainages with the better areas near the Idaho border. Soils under the snow are still quite dry. Below average runoff is forecast for this spring and summer if precipitation over the next six months is near average. If precipitation patterns continue to produce less than average moisture, runoff could be quite low.

For more information contact your local Soil Conservation Service office.

JEFFERSON RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
RED ROCK RIVER near Monida 2	APR-JUL	105.0	72.0	69	110.0	105	34.0	32
	APR-SEP	114.0	77.0	68	118.0	104	36.0	32
BEAVERHEAD RIVER near Grant 2	APR-JUL	149.0	76.0	51	130.0	87	22.0	15
	APR-SEP	174.0	83.0	48	146.0	84	20.0	11
BEAVERHEAD RIVER at Barratts 2	APR-JUL	192.0	116.0	60	185.0	96	47.0	24
	APR-SEP	224.0	134.0	60	215.0	96	53.0	24
RUBY RIVER near Alder	APR-JUL	89.0	64.0	72	94.0	106	35.0	39
	APR-SEP	106.0	76.0	72	112.0	106	40.0	38
BIG HOLE RIVER near Melrose	APR-JUL	696.0	495.0	71	720.0	103	275.0	40
	APR-SEP	757.0	535.0	71	780.0	103	290.0	38
WILLOW CREEK near Harrison	APR-JUL	18.7	13.8	74	21.0	112	7.0	37
	APR-SEP	21.0	15.5	74	23.0	110	8.0	38

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
LIMA	84.0	11.6	27.7	35.6
CLARK CANYON	255.6	167.3	160.5	144.5
RUBY RIVER	38.8	23.0	26.9	23.8

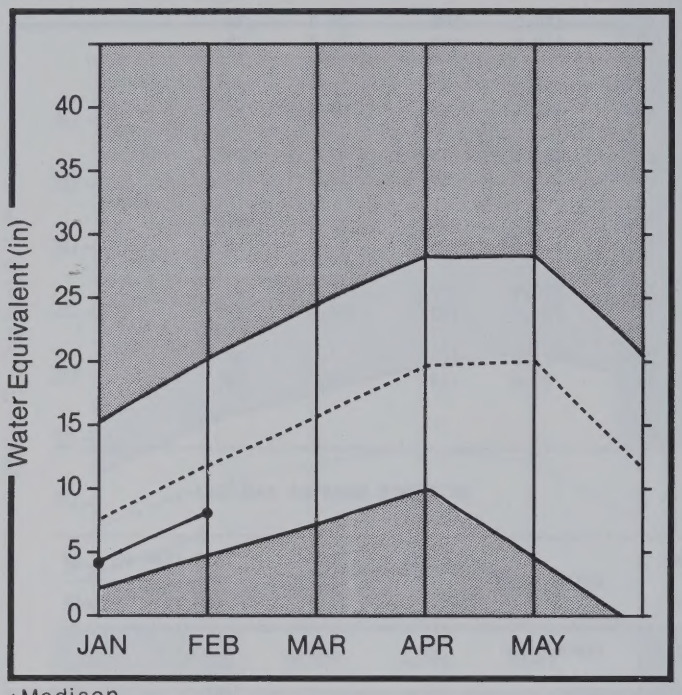
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
BEAVERHEAD	20	126	69
RUBY	5	84	63
BIGHOLE	17	103	69
BOULDER	13	86	58
JEFFERSON	45	110	67

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Madison Basin

Mountain snowpack* (inches)



*Madison

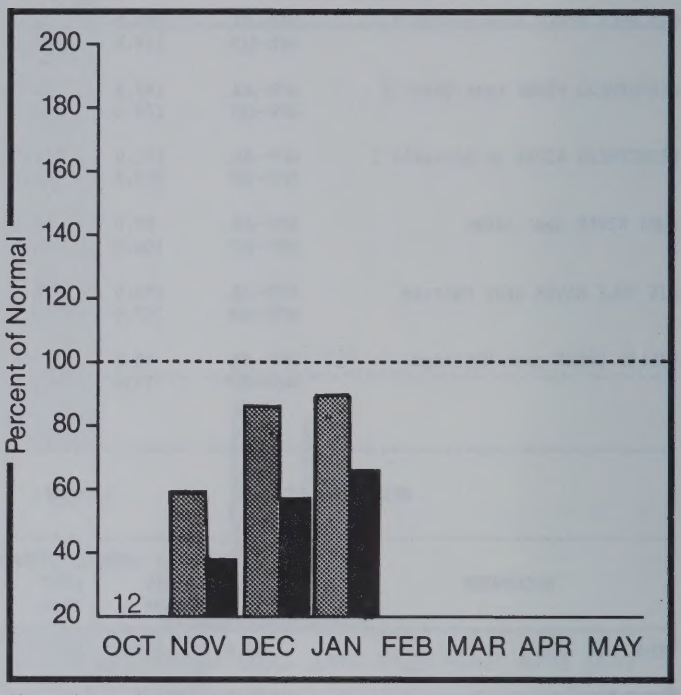
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

During January, mountain precipitation was a little below average over the drainage. More southern areas recorded a little above average amounts. Snowpack is about 70 percent of average above Hebgen Lake and a little less downstream. Soils under the snow are still drier than normal. Based on current snowpack and soil moisture levels and near average precipitation for the next six months, streamflow is forecast to be about 20 percent below average. Smaller tributaries below Hebgen will probably produce even less runoff.

For more information contact your local Soil Conservation Service office.

MADISON RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
MADISON RIVER near Grayling 2	APR-JUL	390.0	320.0	82	395.0	101	245.0	63
	APR-SEP	499.0	410.0	82	505.0	101	315.0	63
MADISON RIVER near McAllister 2	APR-JUL	680.0	535.0	79	670.0	99	400.0	59
	APR-SEP	856.0	665.0	78	840.0	98	495.0	58

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
ENNIS LAKE	41.0	31.6	31.7	34.7
HEBGEN LAKE	377.5	275.2	282.7	242.0

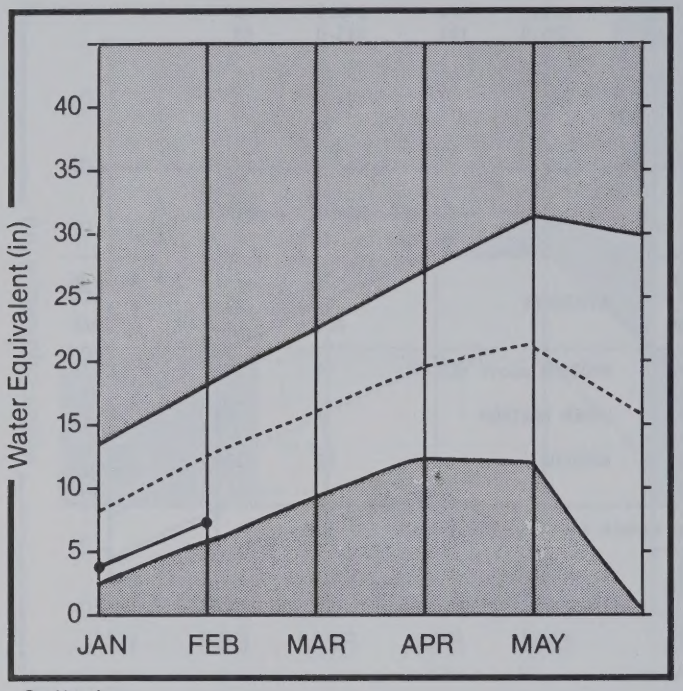
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
MADISON above HEBGEN	10	126	71
LOWER MADISON	9	93	67
MADISON	19	109	69

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Gallatin Basin

Mountain snowpack* (inches)



*Gallatin

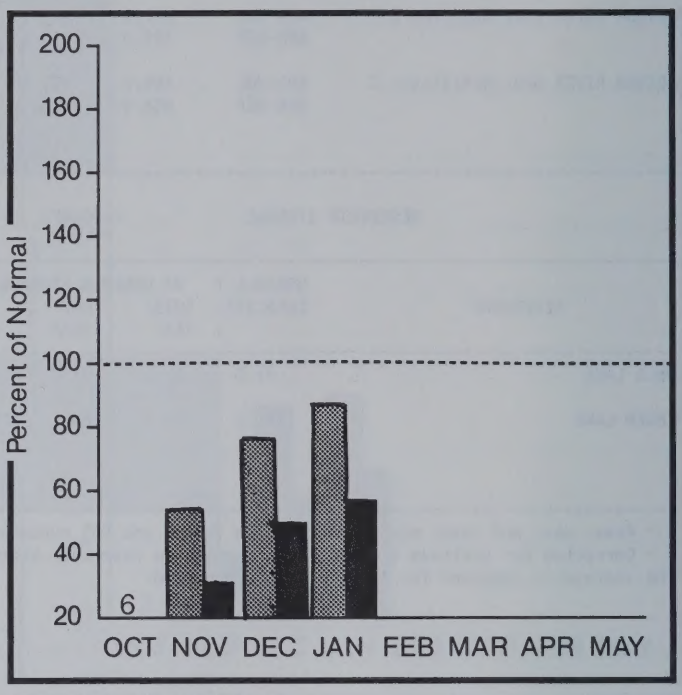
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

January mountain precipitation was about 80 percent of average. Current snowpack water content is about 60 percent of average and a little less than last year. Soils under the snow continue to be drier than usual. Assuming near average precipitation for the next six months and given current snow and soil moisture conditions, spring and summer runoff is forecast to be below average. If precipitation continues to be below average, runoff could be near the lowest of record.

For more information contact your local Soil Conservation Service office.

GALLATIN RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
GALLATIN RIVER near Gateway	APR-JUL	460.0	330.0	72	420.0	91	240.0	52
	APR-SEP	540.0	385.0	71	490.0	91	275.0	51
E & W FK. HYALITE CR. nr Bozeman 2	APR-JUL	24.0	16.5	69	21.0	88	12.0	50
	APR-SEP	28.0	19.3	69	24.0	86	14.0	50
HYALITE CREEK near Bozeman 2	APR-JUL	38.0	26.0	68	34.0	89	18.0	47
	APR-SEP	44.0	30.0	68	40.0	91	20.0	45
GALLATIN RIVER at Logan	APR-JUL	528.0	315.0	60	460.0	87	165.0	31
	APR-SEP	616.0	375.0	61	545.0	88	200.0	32

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
MIDDLE CREEK	8.0	6.1	4.6	3.4

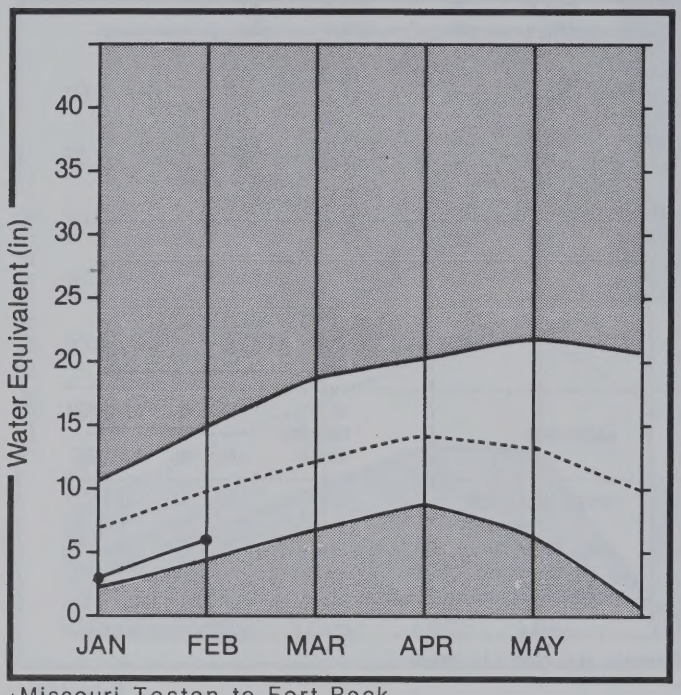
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
UPPER GALLATIN	9	93	63
EAST GALLATIN	12	89	61
GALLATIN	18	94	63

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Missouri Basin

Mountain snowpack* (inches)



*Missouri Toston to Fort Peck

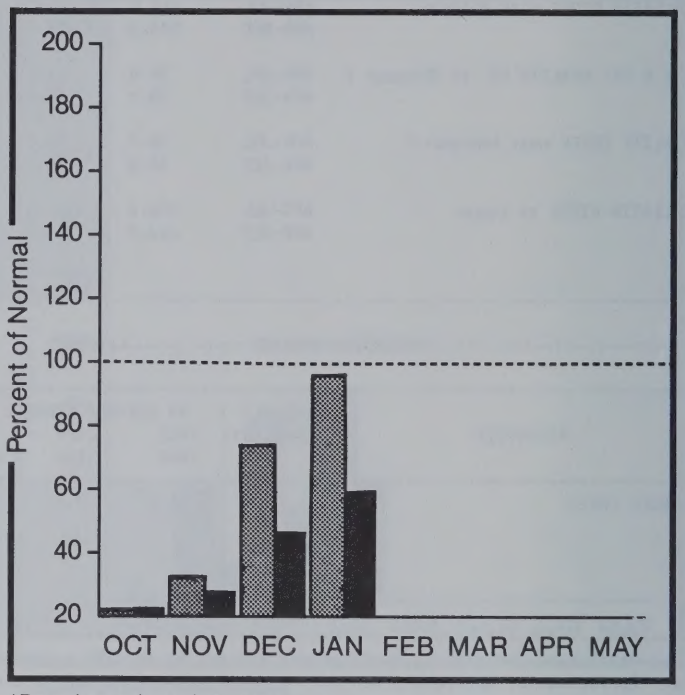
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Mountain precipitation was near average across the drainage during January. Snowpack has improved but is still below average. Most watersheds now have between 55 and 65 percent of average snow cover. Soils under the snow continue to be drier than normal. Given current snowpack and soil moisture conditions and assuming near average precipitation for the next six months, spring and summer streamflow is forecast to be well below average.

For more information contact your local Soil Conservation Service office.

MISSOURI RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
MISSOURI RIVER at Toston 2	APR-JUL	2250.0	1475.0	66	2250.0	100	700.0	31
	APR-SEP	2590.0	1740.0	67	2670.0	103	855.0	33
SHEEP CREEK nr White Sulphur Spgs.	APR-JUL	18.8	12.2	65	20.0	106	4.0	21
	APR-SEP	22.0	14.3	65	24.0	109	5.0	23
BELT CREEK near Monarch	APR-JUL	123.0	70.0	57	117.0	95	23.0	19
	APR-SEP	134.0	77.0	57	128.0	96	26.0	19
MISSOURI RIVER at Fort Benton 2	APR-JUL	3470.0	2000.0	58	3570.0	103	1215.0	35
	APR-SEP	3990.0	2480.0	62	4230.0	106	1480.0	37
MISSOURI RIVER at Virgelle 2	APR-JUL	3960.0	2350.0	59	4350.0	110	1500.0	38
	APR-SEP	4500.0	2835.0	63	5090.0	113	1800.0	40
MISSOURI RIVER near Landusky 2	APR-JUL	4310.0	2560.0	59	5000.0	116	1720.0	40
	APR-SEP	4900.0	3115.0	64	5685.0	116	2010.0	41
N.F. MUSSELSHELL near Delpine	APR-JUL	5.6	3.5	63	6.0	107	1.0	18
	APR-SEP	6.4	4.2	66	7.0	109	2.0	31
S.F. MUSSELSHELL above Martinsdale	APR-JUL	57.0	33.0	58	57.0	100	9.0	16
	APR-SEP	61.0	35.0	57	61.0	100	9.0	15
MISSOURI RIVER below Fort Peck 2	APR-JUL	4260.0	2540.0	60	4900.0	115	1500.0	35
	APR-SEP	4800.0	2965.0	62	5665.0	118	1775.0	37
LAKE SAKAKAWEA Inflow 2	APR-JUL	11000.0	7000.0	64	12100.0	110	4400.0	40
	APR-SEP	12200.0	8195.0	67	13540.0	111	5000.0	41

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
CANYON FERRY LAKE	2043.0	1453.0	1551.0	1621.0
HELENA VALLEY	9.2	5.6	4.4	5.2
LAKE HELENA	10.4	11.1	10.9	10.2
HAUSER & HELENA	61.9	63.6	63.1	60.9
HOLTER LAKE	81.9	78.6	81.0	71.6
SMITH RIVER	10.6	2.4	6.9	6.7
NEWLAN CREEK	12.4	9.0	10.8	8.8
BAIR	7.0	1.9	6.4	4.0
MARTINSDALE	23.1	3.1	12.1	9.9
DEADMAN'S BASIN	72.2	37.8	54.4	45.2
FORT PECK LAKE*	18.9	15.0	16.1	15.1

*Millon Acre Feet

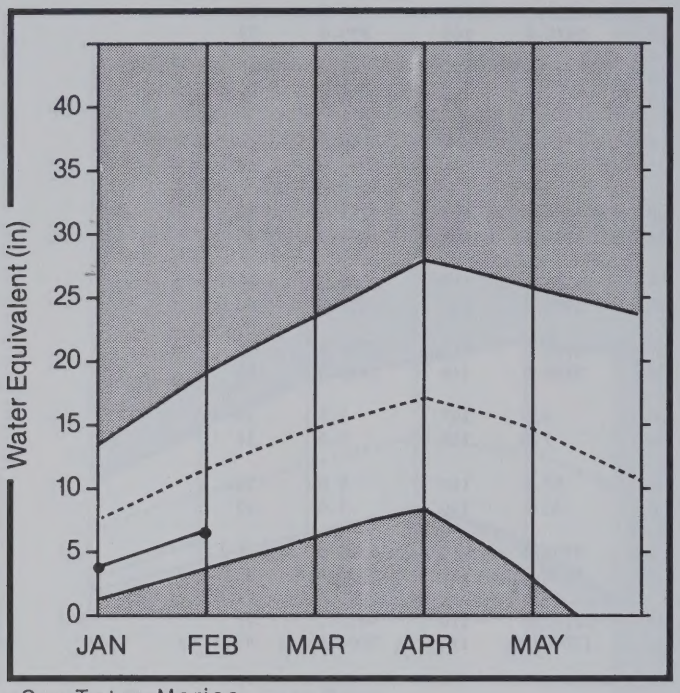
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
MISSOURI HEADWATERS	73	107	67
WEST SIDE MISSOURI	8	81	56
SMITH-BELT	5	110	64
MISSOURI MAINSTEM	13	93	60
SUN-TETON-MARIAS	9	73	60
JUDITH-MUSSELSHELL	8	125	61
MISSOURI above FORT PECK	93	102	65
MILK HEADWATERS	4	57	47
BEAR PAW	7	98	69
MILK RIVER	11	67	53
MISSOURI in MONTANA	102	100	65
MISSOURI blw YELLOWSTONE	189	91	66

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Sun, Teton and Marias Basins

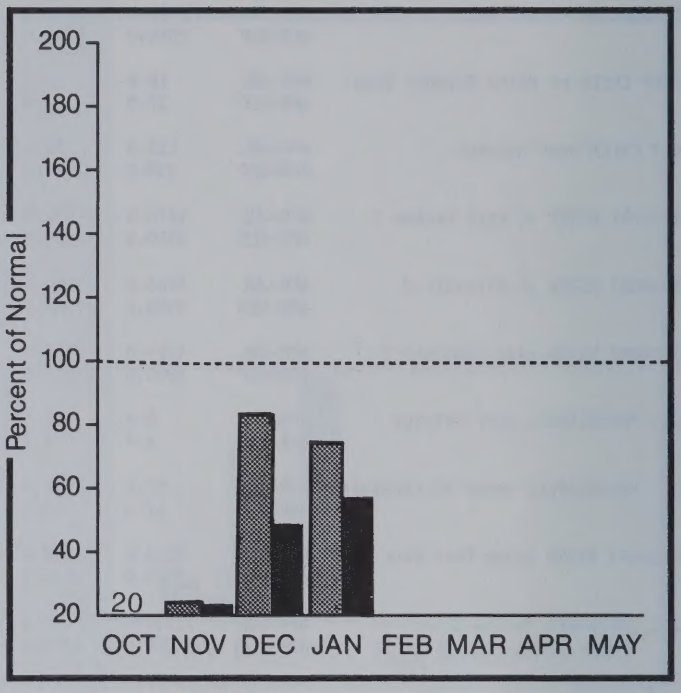
Mountain snowpack* (inches)



*Sun-Teton-Marias

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

January mountain precipitation was about 75 percent of average across the drainage. Currently, snowpack water content is about 60 percent of average. Soils under the snow are still drier than usual. Using current snow and soil moisture levels and assuming average precipitation for the next six months, forecasts of spring and summer runoff are well below average. If below average moisture trends continue, streamflow could be near minimum of record.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
SUN RIVER at Gibson Dam 2	APR-JUL	494.0	345.0	70	475.0	96	215.0	44
	APR-SEP	542.0	380.0	70	520.0	96	240.0	44
TWO MEDICINE CREEK near Browning 2	APR-JUL	222.0	164.0	74	250.0	113	80.0	36
	APR-SEP	235.0	175.0	74	260.0	111	90.0	38
BADGER CREEK near Browning	APR-JUL	107.0	80.0	75	120.0	112	40.0	37
	APR-SEP	123.0	92.0	75	136.0	111	48.0	39
SWIFT RESERVOIR Inflow nr Dupuyer	APR-JUL	70.0	52.0	74	79.0	113	25.0	36
	APR-SEP	82.0	62.0	76	92.0	112	32.0	39
CUT BANK CREEK at Cut Bank	APR-JUL	92.0	66.0	72	101.0	110	31.0	34
	APR-SEP	100.0	73.0	73	109.0	109	37.0	37
MARIAS RIVER near Shelby	APR-JUL	478.0	335.0	70	510.0	107	165.0	35
	APR-SEP	501.0	360.0	72	540.0	108	180.0	36

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
GIBSON	99.1	51.0	51.9	43.0
PISHKUN	32.0	18.3	19.3	17.1
WILLOW CREEK	32.2	23.9	27.3	20.4
LOWER TWO MEDICINE LAKE	11.9	10.3	---	7.7
FOUR HORNS LAKE	19.2	13.7	---	12.3
SWIFT	30.0	23.2	18.4	13.6
LAKE FRANCES	112.0	93.9	83.6	68.5
LAKE ELWELL (TIBER)	1347.0	689.8	703.4	558.0

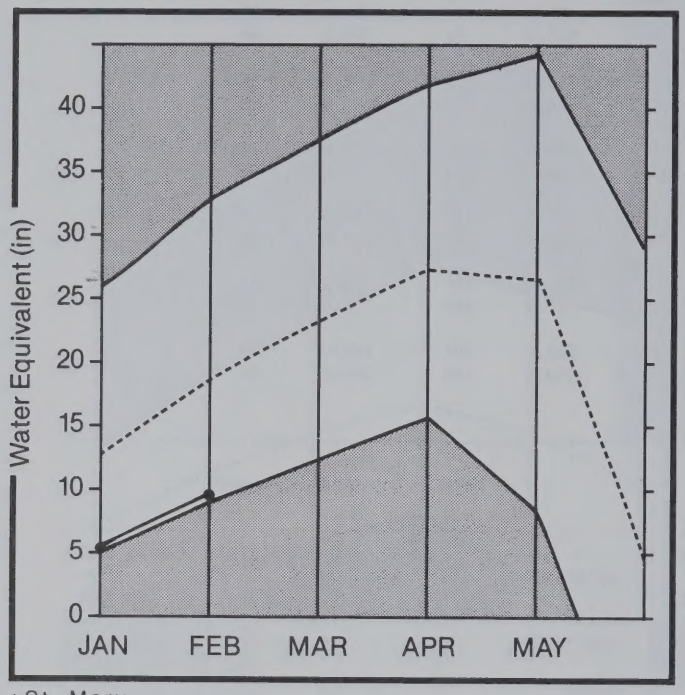
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
SUN-TETON	4	83	62
MARIAS	5	70	60
SUN-TETON-MARIAS	9	73	60

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

St. Mary and Milk Basins

Mountain snowpack* (inches)



*St. Mary

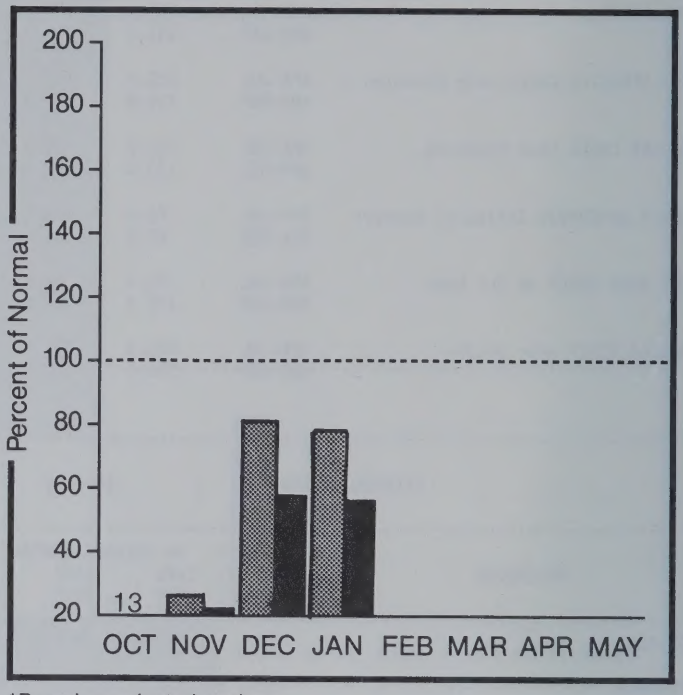
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Mountain precipitation for January was about 70 percent of average in the St. Mary drainage and 130 percent of average in the Bear Paw Mountains. Currently, the snowpack is only about 50 percent of average in the St. Mary and Milk River headwaters and near Glacier National Park. The Bear Paw Mountains have a little better snowpack at about 70 percent of average. Spring and summer streamflow is forecast to be about 75 percent of average on the St. Mary River and its tributaries. The Milk River without the St. Mary Canal is forecast about 60 percent of average. These forecasts assume near average precipitation for the next six months.

For more information contact your local Soil Conservation Service office.

ST. MARY and MILK RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
SWIFTCURRENT CREEK at Sherburne 2	APR-JUL	110.0	82.0	75	108.0	98	56.0	51
	APR-SEP	128.0	98.0	77	129.0	101	67.0	52
ST. MARY RIVER near Babb 2	APR-JUL	404.0	300.0	74	375.0	93	225.0	56
	APR-SEP	474.0	355.0	75	440.0	93	270.0	57
MILK RIVER at Eastern Crossing	MAR-SEP	97.0	58.0	60	107.0	110	40.0	41
MILK RIVER at Eastern Crossing 2	MAR-SEP	270.0	245.0	91				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
LAKE SHERBURNE	64.3	37.3	39.6	21.8
FRESNO	127.0	61.1	62.5	51.2
BEAVER CREEK	3.5	2.8	2.8	1.8
NELSON	66.8	44.4	45.5	37.3

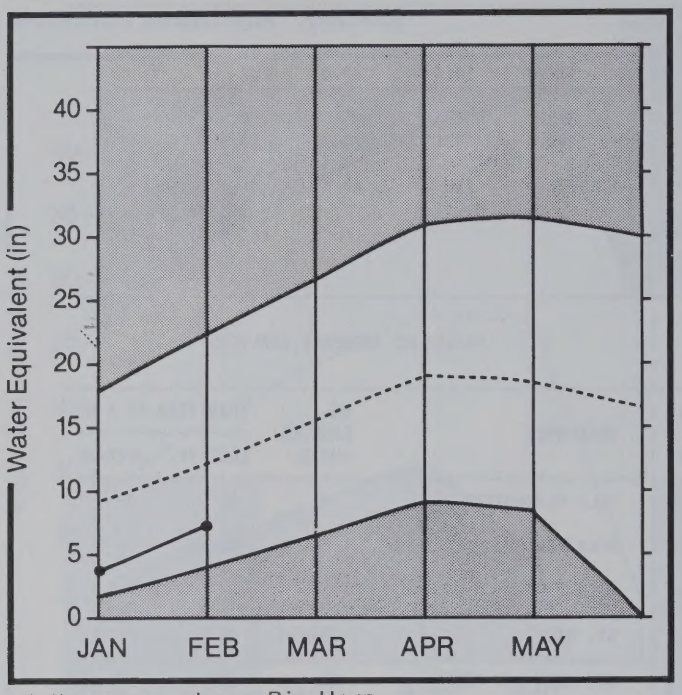
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
MILK HEADWATERS	4	57	47
BEAR PAW	7	98	69
MILK RIVER	11	67	53
ST. MARY	5	61	52
ST. MARY and MILK	12	68	55
BOW RIVER in ALBERTA	11	60	66
OLDMAN RIVER in ALBERTA	4	55	62

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

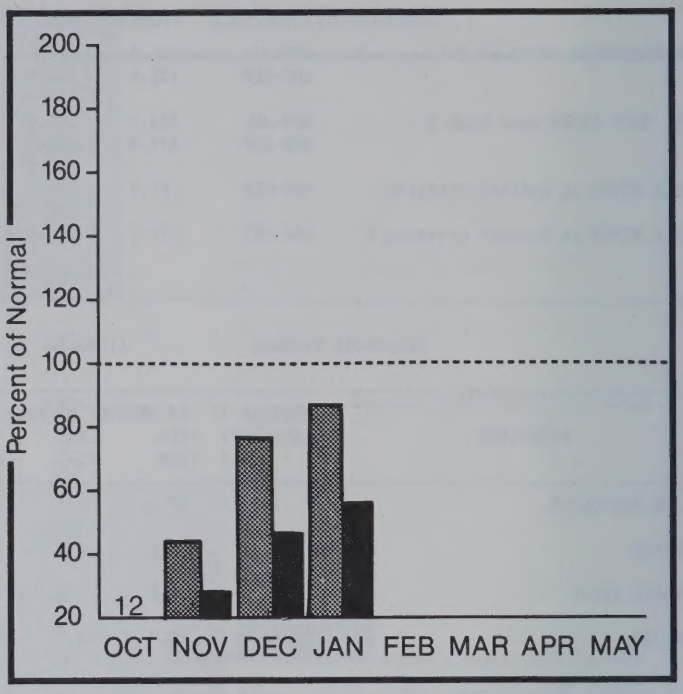
Yellowstone Basin

Mountain snowpack* (inches)



*Yellowstone above Big Horn

Precipitation* (percent of normal)



*Based on selected stations

Maximum

Minimum

Average

Current

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

January mountain precipitation was about 85 percent of average over the Yellowstone River Basin above the Bighorn and a little above average in the Bighorn Mountains. Snowpacks are currently 55 to 60 percent of average in the Upper Yellowstone. Around Red Lodge, the snowpack is only 30 to 35 percent of average. The Bighorn Mountains have 65 to 75 percent of average snowpack while the Wind River Range is about 85 percent of average. Spring and summer streamflows are forecast 60 to 75 percent of average on the Yellowstone River and tributaries above Billings. The inflow to Cooney Reservoir is forecast to be about one-half of average. Streams flowing out of Wyoming are expected to produce 70 to 80 percent of average runoff.

For more information contact your local Soil Conservation Service office.

YELLOWSTONE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
YELLOWSTONE at Lake Outlet	APR-JUL	590.0	405.0	69	505.0	86	305.0	52
	APR-SEP	818.0	565.0	69	704.0	86	426.0	52
YELLOWSTONE at Corwin Springs	APR-JUL	1650.0	1060.0	64	1360.0	82	760.0	46
	APR-SEP	2000.0	1280.0	64	1640.0	82	920.0	46
YELLOWSTONE near Livingston	APR-JUL	1920.0	1180.0	61	1530.0	80	835.0	43
	APR-SEP	2330.0	1430.0	61	1850.0	79	1010.0	43
BOULDER RIVER at Big Timber	APR-JUL	353.0	258.0	73	350.0	99	166.0	47
	APR-SEP	384.0	285.0	74	385.0	100	185.0	48
STILLWATER RIVER nr Absarokee 2	APR-JUL	524.0	375.0	72	550.0	105	200.0	38
	APR-SEP	625.0	460.0	74	670.0	107	250.0	40
CLARKS FORK RIVER near Belfry	APR-JUL	540.0	380.0	70	550.0	102	205.0	38
	APR-SEP	603.0	430.0	71	620.0	103	240.0	40
COONEY RESERVOIR Inflow	APR-JUL	49.0	25.0	51	42.0	86	8.0	16
	APR-SEP	60.0	32.0	53	52.0	87	12.0	20
YELLOWSTONE RIVER at Billings	APR-JUL	3740.0	2500.0	67	3300.0	88	1870.0	50
	APR-SEP	4410.0	2965.0	67	3880.0	88	2250.0	51
BIGHORN RIVER near St. Xavier 2	APR-JUL	1750.0	1365.0	78	2200.0	126	770.0	44
	APR-SEP	1900.0	1520.0	80	2410.0	127	844.0	44
LITTLE BIGHORN RIVER near Hardin	APR-JUL	148.0	115.0	78	195.0	132	30.0	20
	APR-SEP	167.0	130.0	78	220.0	132	32.0	19
TONGUE RIVER near Decker	APR-JUL	234.0	175.0	75	310.0	132	57.0	24
	APR-SEP	260.0	195.0	75	345.0	133	62.0	24
YELLOWSTONE RIVER at Miles City 2	APR-JUL	5640.0	3970.0	70	5800.0	103	2550.0	45
	APR-SEP	6510.0	4625.0	71	6705.0	103	2995.0	46
POWDER RIVER at Moorehead	APR-JUL	230.0	180.0	78	290.0	126	70.0	30
	APR-SEP	251.0	200.0	80	319.0	127	68.0	27
YELLOWSTONE RIVER near Sidney 2	APR-JUL	6260.0	4350.0	69	6500.0	104	2500.0	40
	APR-SEP	7200.0	5015.0	70	7490.0	104	3100.0	43

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
MYSTIC LAKE	21.0	3.8	4.1	9.4
COONEY	27.4	20.2	15.2	13.8
BIGHORN LAKE	1356.0	862.1	819.2	683.0
TONGUE RIVER	68.0	22.6	---	27.7

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
YELLOWSTONE ab LIVINGSTON	18	90	60
SHIELDS	6	99	59
BOULDER-STILLWATER	3	70	61
CLARK'S FORK-ROCK CREEK	13	77	55
YELLOWSTONE above BIGHORN	30	84	58
LITTLE BIGHORN	5	99	78
WIND RIVER (Wyoming)	31	81	84
BIGHORN RIVER (Wyoming)	32	82	65
BIGHORN BASIN (Total)	58	81	71
TONGUE RIVER (Wyoming)	15	84	72
POWDER RIVER (Wyoming)	15	85	63
YELLOWSTONE RIVER	99	82	66

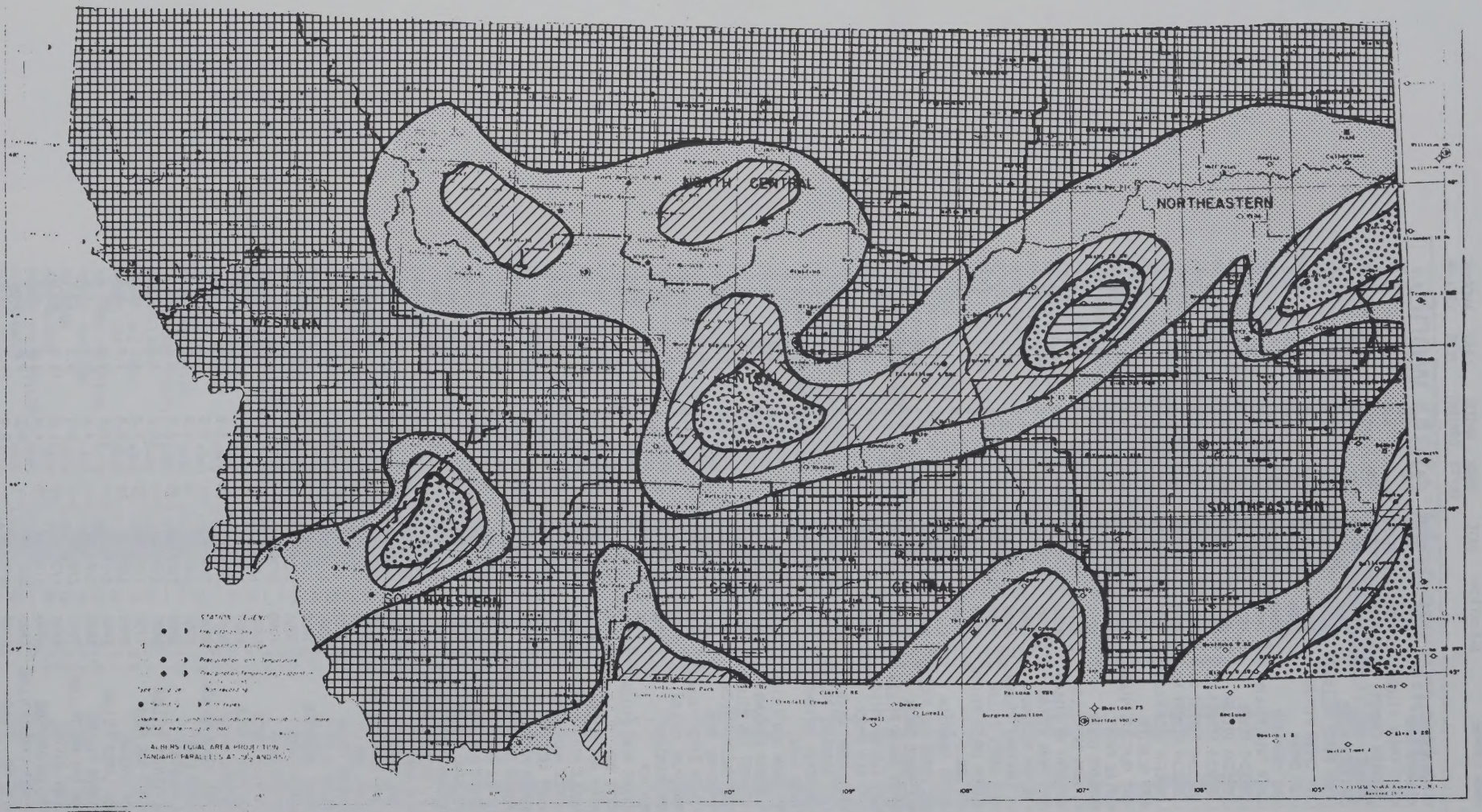
1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

Snow Data Measurements

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
MONTANA						
ARCH FALLS	7350	1/28/88	21	4.6	5.2	7.9
ASHLEY DIVIDE	4820	1/29/88	15	2.5	2.8	5.2
BADGER PASS PILLOW	6900	2/01/88	---	13.7	18.7	22.8
BADGER PASS	6900	1/27/88	51	16.0	23.0	26.8
BANFIELD MTN PILLOW	5600	2/01/88	---	8.2	11.7	14.1
BANFIELD MOUNTAIN	5600	1/26/88	31	5.2	12.2	16.6
BARKER LAKES PILLOW	8250	2/01/88	---	6.6	7.7	10.2
BASIN CREEK	7180	1/27/88	18	3.6	3.9	5.6
BASIN CREEK PILLOW	7180	2/01/88	---	3.4	3.3	5.0
BEAGLE SPGS PILLOW	8850	2/01/88	---	3.0	3.6	5.3
BEAR PAW SKI AREA	5200	1/28/88	19	4.0	3.0	4.9
BEAVER CREEK PILLOW	7850	2/01/88	---	8.3	7.5	12.2
BIG SKY	7700	2/01/88	32	8.5	8.0	9.9
BLACK BEAR PILLOW	7950	2/01/88	---	21.0	16.0	24.4
BLACK PINE PILLOW	7100	2/01/88	---	6.8	5.6	9.5
BLACK PINE	7100	2/02/88	25	5.7	4.7	9.1
BLACKTAIL	5650	1/27/88	24	5.6	--	--
BLOODY DICK PILLOW	7550	2/01/88	---	5.8	6.2	8.7
BLUE LAKE	5900	1/27/88	42	12.0	14.0	17.1
BOULDER MTN PILLOW	7950	2/01/88	---	8.1	9.6	13.5
BOX CANYON PILLOW	6700	2/01/88	---	3.9	5.5	6.3
BOXELDER CREEK	5100	1/28/88	20	4.0	5.5	6.0
BRIDGER BOWL PILLOW	7250	1/28/88	---	9.8	11.6	16.9
BRIDGER BOWL	7250	1/29/88	37	10.7	10.0	18.0
BULL MOUNTAIN	6600	1/29/88	13	3.0	3.3	3.9
CALVERT CR PILLOW	6430	2/01/88	---	4.8	3.9	6.4
CARROT BASIN PILLOW	9000	2/01/88	---	11.3	13.6	18.0
CASHE CREEK PILLOW	7800	2/01/88	---	5.5	4.9	6.0
CHESSMAN RESERVOIR	6200	1/27/88	7	1.4	1.6	2.8
CHICKEN CREEK	4060	1/26/88	29	7.2	6.8	11.0
CLOVER MDW PILLOW	8800	2/01/88	---	7.3	9.3	11.1
COLE CREEK	7850	1/28/88	17	3.6	10.4	11.2
COLE CREEK PILLOW	7850	2/01/88	---	4.1	11.1	10.5
COMBINATION	5600	2/02/88	15	3.0	2.6	3.8
COMBINATION PILLOW	5600	2/01/88	---	3.3	2.7	4.0
COPPER BOTTOM PILLOW	5200	2/01/88	---	5.8	6.5	9.2
COPPER CAMP PILLOW	6950	2/01/88	---	12.7	13.7	23.6
COPPER MOUNTAIN	7700	1/25/88	24	4.6	4.2	7.5
COYOTE HILL	4200	2/01/88	23	5.8	5.6	7.8
CRYSTAL LAKE PILLOW	6050	2/01/88	---	6.9	5.7	9.0
DAISY PEAK	7600	1/29/88	18	3.6	2.8	7.6
DALY CREEK PILLOW	5780	2/01/88	---	5.7	5.3	9.1
DARKHORSE LK. PILLOW	8700	2/01/88	---	10.8	12.8	16.5
DEADMAN CR PILLOW	6450	2/01/88	---	5.2	3.6	7.3
DESERT MOUNTAIN	5600	1/25/88	23	4.6	8.6	10.7
DEVILS SLIDE	8100	1/28/88	29	7.2	9.8	14.5
DISCOVERY BASIN	7050	2/02/88	26	6.0	4.8	7.2
DIVIDE PILLOW	7800	2/01/88	---	4.7	4.5	6.8
DIX HILL	6400	1/31/88	25	6.0	4.6	8.6
DUPUYER CREEK PILLOW	5750	2/01/88	---	4.2	5.4	8.1
EMERY CREEK	4350	1/25/88	28	6.0	8.9	11.8
EMERY CREEK PILLOW	4350	2/01/88	---	6.3	8.0	11.0
FISH CREEK	8000	1/27/88	19	3.6	4.5	6.4
FISHER CREEK PILLOW	9100	2/01/88	---	15.5	16.4	24.9
FLATTOP MTN PILLOW	6300	2/01/88	---	19.0	27.9	31.8
FLEECER RIDGE	7500	1/29/88	23	5.5	4.1	7.3
FOURTH OF JULY	3450	1/26/88	22	5.4	4.4	6.6
FRIDAY HILL	4620	1/26/88	34	8.3	8.7	14.7
FROHNER MEADOWS	6480	1/27/88	15	3.2	4.1	6.0
FROHNER MDWS PILLOW	6480	2/01/88	---	3.0	4.1	6.3
GARVER CREEK PILLOW	4250	1/26/88	---	4.8	5.7	8.3
GARVER CREEK	4250	1/26/88	25	4.3	7.4	8.3
GIBBONS PASS	7100	1/29/88	40	10.7	10.1	16.0
GRAVE CRK PILLOW	4300	2/01/88	---	6.8	9.2	12.4
GRAVE CREEK	4300	1/26/88	28	7.6	9.6	11.8
HAND CREEK PILLOW	5030	2/01/88	---	4.6	5.1	9.5
HAWKINS LAKE PILLOW	6450	2/01/88	---	12.1	14.9	18.8
HAWKINS LAKE	6450	1/26/88	47	12.1	--	20.0
HEART LAKE TRAIL	4800	1/30/88	40	9.8	11.8	15.2
HEBGEN DAM	6550	1/31/88	26	5.4	4.0	8.6
HELL ROARING DIVIDE	5770	1/28/88	42	11.0	13.1	21.3
HERRIG JUNCTION	4850	1/26/88	40	11.3	13.2	18.3
HOLBROOK	4530	1/25/88	15	3.5	5.0	7.4
HOOD MEADOW	6600	1/28/88	20	4.6	5.0	7.3
HOODOO BASIN PILLOW	6050	2/01/88	---	20.1	22.8	31.9
HOODOO BASIN	6050	1/30/88	80	23.5	26.6	34.6
HOODOO CREEK	5900	1/30/88	71	19.4	23.0	31.7
INTERGAARD	6450	1/26/88	21	4.3	4.2	5.5
JOHNSON PARK	6450	1/29/88	15	3.5	2.0	5.0

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
KINGS HILL	7500	1/28/88	23	5.8	4.1	9.5
KIWANIS CAMP	3720	1/29/88	6	1.4	1.0	1.7
KRAFT CREEK PILLOW	4750	2/01/88	---	6.0	6.9	8.9
LAKEVIEW CANYON	6930	1/28/88	20	4.3	3.1	8.2
LAKEVIEW RDG. PILLOW	7400	2/01/88	---	4.9	3.8	8.7
LAKEVIEW RIDGE	7400	1/28/88	20	4.4	2.6	7.5
LEMHI RIDGE PILLOW	8100	2/01/88	---	4.9	5.2	7.0
LICK CREEK PILLOW	6860	2/01/88	---	4.6	5.1	6.1
LICK CREEK	6860	1/28/88	23	5.0	5.7	6.5
LONE MOUNTAIN	8880	2/01/88	36	9.6	10.6	15.7
LOWER TWIN PILLOW	7900	2/01/88	---	7.3	11.1	13.5
LUBRECHT FLUME	4680	1/28/88	15	2.8	3.0	4.6
LUBRECHT PILLOW	4680	2/01/88	---	4.2	3.2	4.1
LUBRECHT FOREST NO 3	5450	1/29/88	13	2.7	2.7	5.3
LUBRECHT FOREST NO 4	4650	1/29/88	8	1.6	1.4	2.9
LUBRECHT FOREST NO 6	4040	1/29/88	11	1.9	2.2	3.4
LUBRECHT HYDROPLOT	4200	1/28/88	17	3.0	3.0	5.8
MANY GLACIER	4900	1/31/88	27	5.8	11.0	14.5
MANY GLACIER PILLOW	4900	2/01/88	---	5.4	10.1	13.2
MARIAS PASS	5250	1/31/88	23	5.1	10.4	11.6
MAYNARD CREEK	6210	1/29/88	23	6.3	6.3	10.4
MAYNARD CR PILLOW	6210	1/29/88	---	5.0	4.5	8.0
MONUMENT PK PILLOW	8850	2/01/88	---	7.8	10.0	13.9
MOSS PEAK PILLOW	6780	2/01/88	---	14.0	18.1	26.0
MOULTON RESERVOIR	6850	1/28/88	19	3.5	2.9	4.5
MT LOCKHART PILLOW	6400	2/01/88	---	9.7	11.4	14.0
MULE CREEK PILLOW	8300	2/01/88	---	7.0	8.7	8.6
NEVADA CREEK PILLOW	6480	2/01/88	---	5.6	6.0	8.5
NEW WORLD	6900	1/28/88	31	7.8	7.7	10.0
NEWTON MOUNTAIN	5600	1/26/88	50	14.0	14.5	23.6
NEZ PERCE CMP PILLOW	5650	2/01/88	---	8.7	7.0	9.9
NEZ PERCE CREEK	6600	1/25/88	18	3.0	3.2	4.8
NOISY BASIN PILLOW	6040	2/01/88	---	15.6	15.7	28.6
N.F. ELK CR PILLOW	6250	2/01/88	---	5.4	5.6	8.5
N.F. ELK CREEK	6250	1/28/88	20	4.4	5.3	8.4
NORTH FORK JOCKO	6330	1/27/88	54	16.5	20.9	28.2
N.E. ENTRANCE PILLOW	7350	2/01/88	---	4.1	3.8	6.3
NORTHEAST ENTRANCE	7350	2/01/88	18	3.6	4.0	6.8
OPHIR PARK	7150	1/31/88	30	7.4	6.8	11.6
PETERSON MDW PILLOW	7200	1/29/88	---	4.6	4.9	6.8
PETERSON MEADOWS	7200	1/29/88	23	5.5	4.9	6.7
PICKFOOT CRK PILLOW	6650	2/01/88	---	5.6	5.9	6.9
PIKE CREEK PILLOW	5930	2/01/88	---	10.9	16.4	18.5
PIPESTONE PASS	7200	1/25/88	11	2.0	2.7	3.5
PLACER BASIN PILLOW	8830	2/01/88	---	7.1	11.3	10.8
PORCUPINE PILLOW	6500	2/01/88	---	2.4	2.3	4.9
RED MOUNTAIN	6000	1/27/88	28	6.3	--	12.9
RED TOP	5260	1/26/88	40	11.0	11.6	19.6
ROCKER PEAK PILLOW	8000	2/01/88	---	5.4	6.9	9.6
ROCKY BOY	4700	1/28/88	13	2.0	2.4	3.4
ROCKY BOY PILLOW	4700	1/28/88	---	3.0	3.4	3.9
SADDLE MTN PILLOW	7900	2/01/88	---	12.7	11.3	18.2
SADDLE MOUNTAIN	7940	1/29/88	42	11.4	11.7	17.6
SHORT CREEK	7000	2/01/88	12	2.4	3.0	--
SHOWER FALLS	8100	1/28/88	31	8.3	10.7	15.7
SHOWER FALLS PILLOW	8100	2/01/88	---	9.6	11.7	15.5
SILVER RUN	6630	1/28/88	6	1.1	--	3.6
SILVER RUN PILLOW	6630	2/01/88	---	2.3	2.9	3.6
SKALKAHO PILLOW	7260	2/01/88	---	12.1	11.1	16.8
SKYLARK TRAIL PILLOW	6200	2/01/88	---	15.7	14.6	20.1
S.F. SHIELDS PILLOW	8100	2/01/88	---	6.6	6.5	11.4
SPUR PARK PILLOW	8100	2/01/88	---	8.5	7.0	15.0
STAHL PEAK	6030	1/26/88	48	13.8	28.8	26.5
STAHL PEAK PILLOW	6030	2/01/88	---	12.7	24.2	25.1
STORM LAKE	7780	1/29/88	28	7.0	5.4	9.1
STRYKER BASIN	6180	1/26/88	41	10.8	21.0	21.7
STUART MILL	6500	1/26/88	20	4.3	3.8	4.4
STUART MOUNTAIN	7400	1/27/88	46	14.8	15.4	21.9
SUCKER CREEK	3960	1/28/88	0	.0	.4	.7
TAYLOR ROAD	4080	1/28/88	11	2.0	1.1	3.1
TEN MILE LOWER	6600	1/26/88	16	3.2	3.9	5.2
TEN MILE MIDDLE	6800	1/26/88	20	4.3	6.0	7.8
TEN MILE UPPER	8000	1/26/88	23	5.0	6.0	9.5
TEPEE CREEK PILLOW	8000	2/01/88	---	6.5	5.9	8.9
TRUMAN CREEK	4060	1/22/88	9	1.6	2.2	3.1
TV MOUNTAIN	6800	1/27/88	30	8.5	8.4	12.6
TWELVEMILE PILLOW	5600	2/01/88	---	10.2	9.3	12.7
TWENTY-ONE MILE	7150	1/29/88	32	7.2	4.1	12.3
TWIN CREEKS	3580	1/25/88	20	5.5	7.0	8.8
TWIN LAKES PILLOW	6400	2/01/88	---	19.6	19.6	29.0
WALDRON PILLOW	5600	2/01/88	---	4.8	5.9	7.5
WARM SPRINGS PILLOW	7800	2/01/88	---	9.2	9.5	17.6
WEASEL DIVIDE	5450	1/26/88	47	14.0	19.4	23.0
WEST YELLOWSTONE	6700	1/29/88	22	4.4	3.4	8.2
WHISKEY CREEK PILLOW	6800	2/01/88	---	8.3	7.4	11.1
WHITE MILL PILLOW	8700	2/01/88	---	9.6	10.7	17.0
WILLOW CREEK	6500	1/28/88	10	2.0	4.4	5.6
WOOD CREEK PILLOW	5960	2/01/88	---	3.8	4.4	6.9

Valley Precipitation



Over 130%

110 - 130%

90 - 110%

70 - 90%

Under 70%

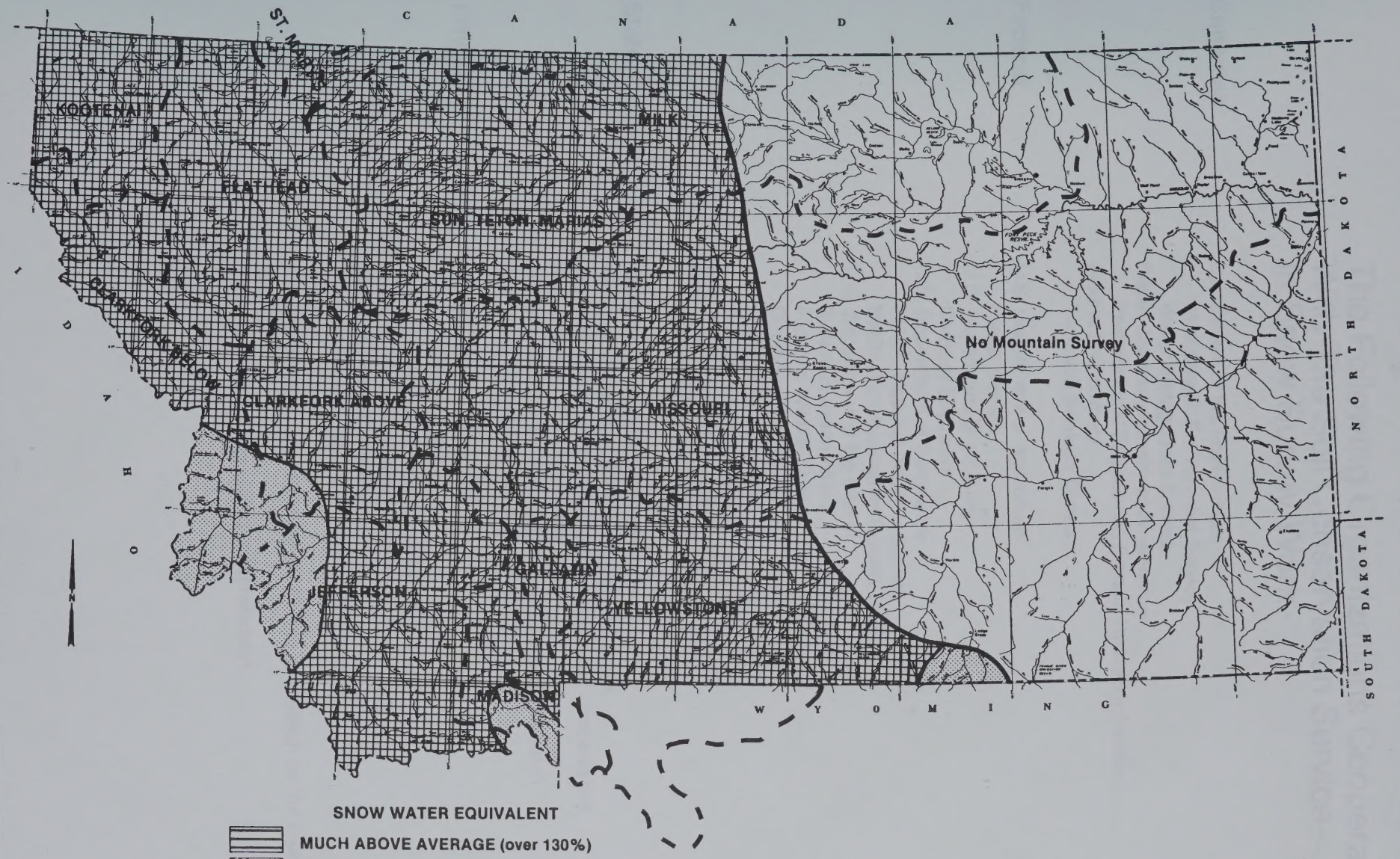
JANUARY 1988

Source: NWS
Great Falls, MT

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

MOUNTAIN SNOWWATER EQUIVALENT FOR MONTANA



SNOW WATER EQUIVALENT

- MUCH ABOVE AVERAGE (over 130%)
- ABOVE AVERAGE (110-130%)
- NEAR AVERAGE (90-110%)
- BELOW AVERAGE (70-90%)
- MUCH BELOW AVERAGE (below 70%)
- NO MOUNTAIN SURVEY

%1961-85 AVERAGE

FEBRUARY 1,1988

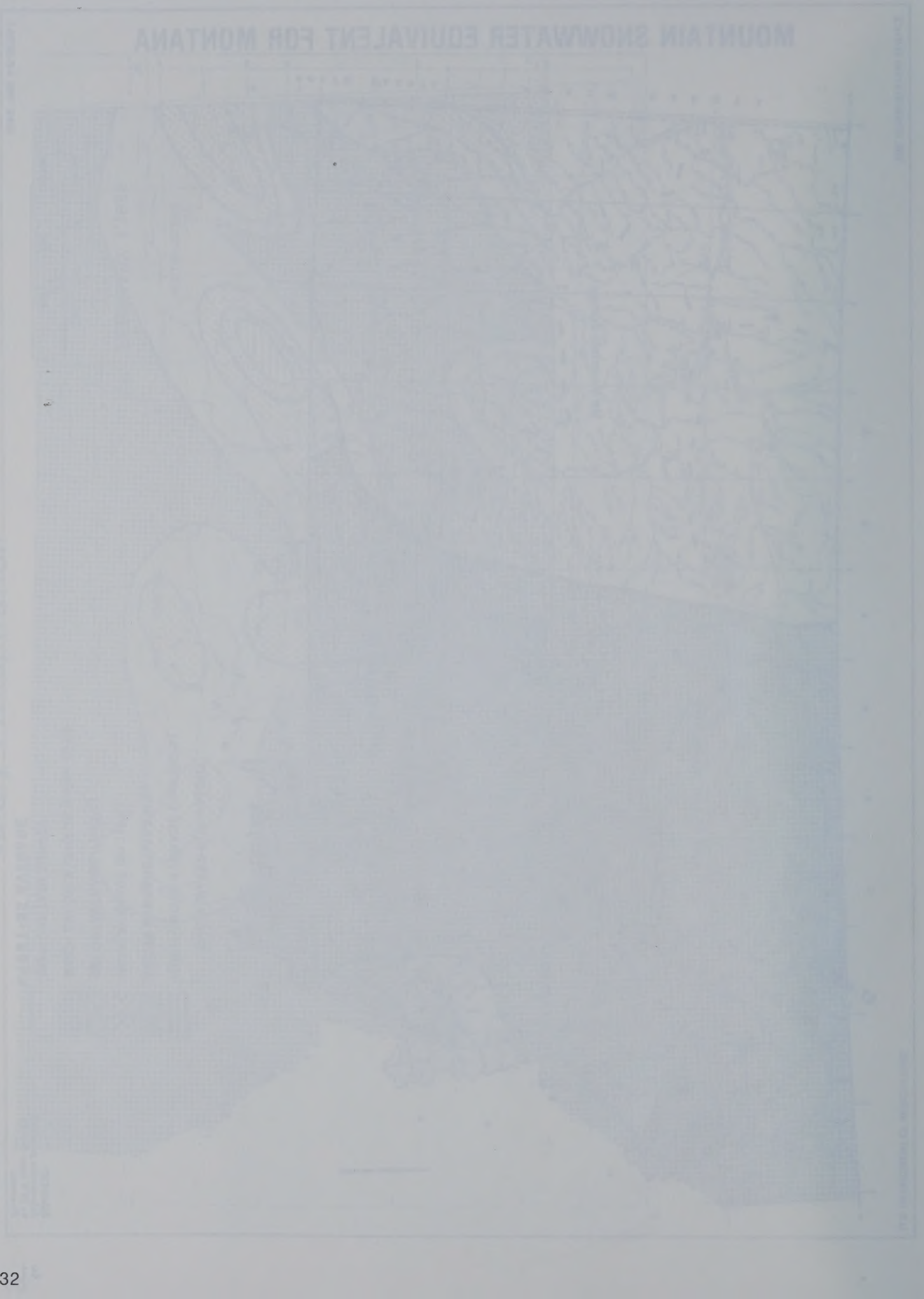
0 25 50 75 100 MI

0 50 100 150 KM

SOURCE:
Information provided by SCS Snow Survey Personnel.

JUNE 1985 4-R-39296-1

USDA-SCS-FORT WORTH, TEXAS 1985



The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canadian

Department of the Environment
- Atmospheric Environment Service
- Water Management Service

British Columbia Ministry of Environment
- Inventory and Engineering Branch, Hydrology Section

Alberta Environment
- Technical Services Division

Federal

U.S. Department of Agriculture
- Forest Service

U.S. Department of the Army
- Corps of Engineers

U.S. Department of Commerce
- NOAA, National Weather Service
- National Environmental Satellite Service

U.S. Department of the Interior
- Bureau of Indian Affairs
- Fish and Wildlife Service
- Geological Survey
- National Park Service
- Bureau of Reclamation

U.S. Department of Energy
- Bonneville Power Administration

State

Montana Conservation Districts
Montana Department of Fish, Wildlife, and Parks
Montana Department of Natural Resources and Conservation
Montana Department of State Lands
Montana State University - Agricultural Experiment Station
University of Montana - School of Forestry

Private

Big Sky of Montana
Butte Water Company
Confererated Salish & Kootenai Tribes
Flathead Valley Comminity College
Montana Power Company
Pondera County Canal & Reservoir Company

Other organizations and individuals furnish information for the snow survey reports.
Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SNOW SURVEY UNIT
Federal Bldg., Rm. 443
10 East Babcock Street
Bozeman, MT 59715

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS

PERMIT NO G-267

THIRD CLASS MAIL

Montana
Water Supply Outlook

and

Federal-State-Private
Cooperative Snow Surveys

SOIL CONSERVATION SERVICE

U.S.GOVERNMENT PRINTING OFFICE: 1988--591-110